Casting Reliability, Building Trust

EuroGear USA has an innovative approach to providing replacement parts for failed machinery.

Introduction

Manufacturers, processors and mechanical system operators rely on the unwavering performance of their heavy machinery. While complex mechanical systems can be designed for reliability and performance, they are nevertheless subject to fatigue. At the most inopportune time, manufactured components can fail. The result is lost production and revenues. The sophisticated precision with which heavy machinery components (namely gearing systems) must be manufactured, limits the number of qualified providers who can build and repair at a moment's notice.

The slightest of design variances in a newly fabricated or repaired part not only reduces productivity, it can create a hazardous environment. The challenge is to deliver a better product sooner, without compromising the quality. Despite these ideals, the accepted norm within the production component fabrication industry is long lead times, resulting in limited productivity.

Traditionally, production facilities have had no choice but to wait for replacement parts to be correctly fabricated and delivered. It is not uncommon for emergency replacement parts to take twice as long as originally promised.

The question is: can a production plant greatly limit the effects of part failure, maintain quality and production schedule, while waiting on replacement parts? To further complicate the answer, original prints can be difficult to acquire. Lead times for large critical gears and other production components can be many months if not years. Manufacturing on short notice without extensive analysis has historically been out of the question.

Reprinted from WORLD CEMENT October 2008
www.worldcement.com

The pace of business is such that clients who sense the inability to produce at the highest levels of quality will simply go elsewhere. In an attempt to reduce costs, many plants have recently experimented with shipping component parts from China. This has turned out to be a very costly experiment as quality issues are severe and continue to plague such a decision. Companies that manufacture and repair mill parts in North America are typically large corporations without the time or desire to meet the individual needs of each client.

Hours after this support roller broke and shut down the kiln, EuroGear USA quickly analysed the situation and worked closely with the client to set up an emergency programme to get the kiln back up and running as soon as possible. The kiln was running 3 weeks later, versus the proposed 38 weeks by the OEM.

EuroGear keeps an inventory of all types and sizes of material and emergency machines on hand 24/7. By having facilities large enough, this 70 000 lb roller is small for the company's large equipment.

EuroGear manufactures gearing up to 20 in. dia., 44 in. face, and all types: spur, helical, double helical, internal and external even bevels.

The cost of failure

Part failure is an inevitable pivot in the life cycle of production machinery. Based on analysis and testing, parts have an estimated operational life span. Adequate maintenance and proper operation can aid parts in reaching this positive expectancy. However, there is always the possibility that undetected flaws, design inaccuracies, sub-standard part materials, or improper system operation can lead to premature failure. For example, parts that have been cast routinely hide defects for indeterminate amounts of time. Sand inclusions, porosity and cracks can covertly elevate the risk of failure. Such failure is compounded if occurring in a mission-critical portion of the production cycle. Even more damaging are the idle production lines that project a negative image of the facility onto current customers and potential clients.

The greatest enemy of recovering from part failure is time. Time is lost waiting for original design specifications to be provided by manufacturers, or in waiting for third party manufacturers to create replacement parts that may have questionable standards. Production facilities are left with very few viable options.

Cement industry

While production component failures can occur in any manufacturing process, the effects of failure within cement production are wide reaching. Many failures not only halt production, but can result in massive damage to surrounding, peripheral systems. Many of the largest gearing systems drive mission-critical equipment. Solving the challenges that exist within the cement industry can be complex.

The proper fabrication, maintenance and repair of support rollers, ball mills, crushers, mill heads, and gear boxes are all vital to efficient cement plant operation. Cement manufacturers manage a very complicated environment that directly affects all equipment, especially kiln components. Normal operational wear, stress and corrosion can together cause early component failure. To counter costly kiln failure, welding and other coating methods have been established to extend the kiln's operational life. The integrity of a kiln repair depends largely on the choice of welding or coating materials. Today, manufacturers must accomplish higher rates of productivity at the lowest possible cost. Plants operate for longer periods with higher production rates, which makes the choice of materials, and the skilled personnel that builds and/or repairs these components, a crucial decision. On discovering a part failure, the plant must decide to fabricate a new part or attempt to repair the current one.

Component repair

In order for a plant to justify a total kiln replacement, several factors have to be considered: availability of

spare components, the cost involved, the possibility of improved performance, and the age of the plant itself. Once a plant has decided to replace a failed kiln, not only must a skilled manufacturer be located for the replacement, but that manufacturer must also have a plan in place to maintain and service the new equipment. This requires innovative systems operated by skilled engineers and seasoned machinists.

Other considerations of whether to repair or replace a failed component are that kilns have constant exposure to bending, cycling and compression. Cracks below the surface are known to form as a result of these and other dynamic motions. By the time cracks are noticed, serious damage may have already occurred. Therefore, simply repairing a kiln can never fully assure a plant that the original issue has been comprehensively addressed.

Component replacement

If the plant decides to build a component part from scratch, there exists a need to partner with a company that understands and has experience with all the numerous elements of a component life cycle. A skilled provider best positions the plant for routine and emergency service.

Securing a quality service provider is as important as securing quality parts. Failure of even a small portion within a production line can result in a complete halt of operations; a halt that cannot be resumed until the failed parts or systems have been repaired or replaced. A lack of production due to inadequate part construction is unacceptable. Plant facilities must have dependable service teams that can deploy on a moment's notice and immediately solve problems. Although production plants carry replacement parts, there are no additional options when those replacement components fail. A dependable service team is critical.

Meeting industry challenges

While many production facilities accept long lead times and extended downtimes after a part failure as inevitable, some service providers are turning this convention on its head. This has been accomplished by developing an approach that minimises downtime between part failure, restoration and production. These providers understand that today's business environment does not accept delays, and that facilities need to rebound quickly from failure to maintain acceptable production levels.

EuroGear USA, an innovative leader in gear system fabrication, mill production components, maintenance and repair, recognised these challenges and created a model that is gaining wide acclaim. It is based on generating quality, custom-made system parts, with unparalleled turnaround time. EuroGear engineers produce replacement parts that exactly match or exceed original specifications. Using state-of-the-art-equipment, the team routinely presents solutions that have not previously been considered by the customer in order to implement the best long-term production strategy.

A new approach

Domestic manufacturing

EuroGear has four advanced manufacturing facilities throughout North America. By engineering and manufacturing replacement parts locally, it can respond more rapidly to the needs of customers and has eliminated the significant time and cost of overseas freight shipments. The company can also more readily monitor and control the quality of domestic manufacturing operations.

Mobile machining

Customer service is elevated by providing mobile

A double pinion replacement set manufactured by the company's reverse engineering team.

The company can provide 4 in. thick x 10 ft. wide x 50 ft. dia. kiln shell replacements.

In this case, EuroGear quickly responded to recreate a pinion gear and reverse engineered it to fit into a different intermediate gear to save the client time and money.

machining crews that can perform on-site maintenance at production facilities. For some repair operations, this allows maintenance to be performed far more rapidly, ensuring a quicker return to production.

EuroGear's facilities are well-equipped with all the necessary equipment and logistics, such as 100 t cranes, railroad tracks that enter the shop, and the facilities are even located on water so shipments can be easily transported.

By not cutting corners and using North American steel mills and foundry, EuroGear provides superior quality ball mills that outperform and last.

EuroGear helps with both schedule change outs and breakdowns.

Emergency Preparation Programme (EPP)

EuroGear has implemented an emergency programme unlike anything found in the manufacturing industry. When taking on a new client, machinery, staff capabilities and maintenance schedules are analysed, and determinations suggested as to any special materials to use. This information is placed in a general database that is accessible by the company's engineers and machinists across the country. If and when an emergency occurs, engineers can be dispatched within 24 hours to immediately begin solving the issue.

Online project tracking

The company's unique web application allows clients to log in to a secure, private portal of its website. Here, they can monitor the progress of their project. This service provides 24-hour access to the information managers routinely need for production meetings.

Innovative response mechanics

The company has the knowledge and equipment to replicate any part without having to wait for original plans. Its custom-designed systems can begin fabrication long before original plans are tracked down. Engineers are sent on-site to measure, map and draw samples of the component. This information is sent back electronically to the EuroGear facilities; the part is under construction before the engineers have returned to their office.

Expedited replacement

As a result of this innovative approach, lead times for even the most complex gearing systems and mill production components can be reduced by as much as 90%. Lead times of months have been reduced to weeks.

Conclusion

By utilising this approach, EuroGear is quickly becoming a premier production facility partner. Accurate fabrication, skilled engineering, high-quality components and fast turnarounds immediately add to the bottom line. The company has the acute capability to engineer and manufacture custom parts that exactly match or exceed OEM specifications. Fabricated parts include mill heads, kilns, support rollers, ball mills, gears, gearboxes, trunnions and babbiting. New parts can be fabricated with natural wear and tear in mind. This allows for new component parts to fit perfectly with old or used equipment. EuroGear believes in careful planning, and precision execution.

With a commitment to exceptional customer service throughout the entire process, the company can address problems more efficiently, develop a strategy, and rapidly deploy equipment and personnel. This allows its clients to quickly return to productivity. With a philosophy of establishing one-on-one relationships with each client, EuroGear is said to be becoming the first call for multiple plants around the world, whether it involves large OEM projects, or small part fabrications.